

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

LEIGHTON TECHNOLOGIES LLC,

Plaintiff,

vs.

OBERTHUR CARD SYSTEMS, S.A. and  
OBERTHUR CARD SYSTEMS OF  
AMERICA CORPORATION,

Defendants.

OBERTHUR CARD SYSTEMS, S.A. and  
OBERTHUR CARD SYSTEMS OF  
AMERICA CORPORATION,

Counterclaim Plaintiffs,

vs.

LEIGHTON TECHNOLOGIES LLC,  
GENERAL PATENT CORPORATION  
INTERNATIONAL, GENERAL PATENT  
CORPORATION, and IP HOLDINGS LLC,

Counterclaim Defendants.

04 Civ. 02496 (CM) (LMS)

**DECLARATION OF DR. DAVID  
EVERETT SUBMITTED IN  
OPPOSITION TO DEFENDANTS'  
MOTION FOR SUMMARY  
JUDGMENT OF NON-  
INFRINGEMENT**

**Hon. Colleen McMahon**

**Magistrate Judge Lisa M. Smith**

**PUBLIC VERSION**

**Confidential Information Removed  
Pursuant to the Protective Order  
Entered on August 20, 2004**

I, Dr. David Everett hereby declare as follows:

**Background**

1. I am the Managing Director and Principal Consultant of MicroExpert Limited, a smart card specialist consultancy. I am Technical Director of Smart Card News Ltd., an independent international subscription newsletter. I am a consultant on the UK Government's CESG Listed Advisor Scheme (CLAS) and have previously led a team which developed a security evaluation model for smart cards for CESG.

I have led a small team which developed a risk model for the Scottish Executive concerned with their planned roll-out of a new contactless smart card travel concession card scheme. I am an approved consultant to the Scottish Executive and have been responsible for training all the Local Authorities in Scotland on the use of smart cards for citizen applications. I have also been responsible for training the DVLA (Driver and Vehicle Licensing Agency) on the technology of smart cards.

I have been involved in the development of many smart card schemes and supporting infrastructures including 'Rosco' a secure lightweight card management system for remote control of smart card applications and platforms using public key cryptography. I have led the development of a security system for citizen cards, one implementation of this is being used by Aberdeen city council in their Accord Card.

2. I have been involved in the field of smart cards since 1986. In the course of my experience in the industry, I have visited and observed the manufacturing facilities for virtually every major manufacturer of smart cards. I am also familiar with and have dealt with many of the key suppliers of plastics and other materials to the smart card industry. I have personally

worked on standards committees responsible for revising the drafts of some of the ISO standards for manufacturing and testing smart cards, including ISO 7816 and ISO 10373. I am a listed inventor on approximately 15 patents. Additionally, I have authored and/or assisted in the publication of numerous articles and compilations, including authorship of the primer entitled "Introduction to Smart Cards."

3. I graduated from Southampton University in 1976 and joined the Medical Research Council, Mill Hill, London as Head of Electronics. I was subsequently made Director of Computing and Electronics. I founded Open Computer Security Ltd in 1980, which was responsible for the design of tamper resistant cryptographic hardware modules that authenticated messages for CHAPS (Clearing Houses Automated Payment Scheme), I then went on to be a security consultant at EftPos UK (Electronic Funds Transfer at the Point of Sale), a company set up under the APACS umbrella, from 1985 to 1990 where I was responsible for the security design of the first commercial product to use the RSA cryptographic algorithm. In this role I also represented the UK banks in developing the security strategy for smart cards in payments through APACS (Association for Payment Clearing Services), the UK trade association for payments. It currently has 31 members whose payment traffic volumes account for approximately 97% of the total UK payments market. This study work involved visits to all the major chip and smart card manufacturing companies in Europe.

4. During 1990 to 2000, I was Technical Director for Platform Seven (originally known as NWDT), a division of the National Westminster Bank. I was the technical architect of Mondex, a new concept for a Smart Card electronic purse. I was also responsible for the design and development of a multi-application Smart Card operating system based on the use of a virtual machine in the IC chip known as Multos. During the course of this work I was involved with all

the major chip and smart card manufacturing companies during which time I undertook extensive studies to ensure that we could achieve the necessary reliability and security in a smart card product. During this period I rejected the use of contactless smart cards for this project on the grounds of inadequate reliability due to manufacturing difficulties. I first proposed the use of a virtual machine for Smart Cards in 1985 while working on the ISO 7816 standard. I was awarded the IEE Ambrose Flemming award for the design of a Compton Effect gamma ray camera in 1978, and in 1984 the BCS Application Award for the design of a software protection system using enciphered code.

5. I have been asked by plaintiff Leighton Technologies LLC (“Leighton”) to render an independent expert opinion based on my knowledge of plastic identification cards with embedded electronics, and my review of relevant materials, with regard to whether certain contactless smart cards made by Oberthur Card Systems, S.A., and Oberthur Card Systems of America Corp. (“Oberthur”) infringe claims of US Patent Nos. 5,817,207 (the ‘207 patent) and/or 6,214,155 B1 (the ‘155 patent) (collectively “the Patents”). I am being compensated at the rate of £150 (approximately \$294) per hour, plus expenses, for my work on this matter.

6. Among other things, my opinions in this case are based on my background and experience; discussions with counsel; my visit to Oberthur’s facility in Exton, Pennsylvania; my research and investigation into the facts of this matter; and, my review of the Patents and related papers for this matter. I have had the opportunity to meet with Keith Leighton, the inventor of the Patents, and others as well, about their manufacturing experiences at the relevant times of the inventions. I have reviewed the papers filed by Oberthur in support of their Motion for Summary Judgement of Non-Infringement, particularly the assertions made by Dr. David Kazmer, Oberthur’s expert.

**Analysis and Conclusions**

7. In forming my opinions, I was asked to consider whether the contactless smart cards made by Oberthur for American Express, Chase, Citizens, and others<sup>1</sup> infringe claims of the '207 patent and/or claims of the '155 patent. I have considered the available facts, agreements between the parties, testimony, exhibits and samples concerning these cards. I have considered Judge McMahon's Claim Construction Rulings. I have considered the Patents and their prosecution history. I have considered the meaning of the remaining terms in each claim (those not discussed in the Judge's Claim Construction Rulings). I have reviewed the Summary Judgment papers filed by Oberthur, and the supporting declarations and attachments. I understand that Oberthur's Summary Judgment motion is based upon the argument that certain limitations are not present in their smart cards. As set forth in greater detail in my expert report, I believe that all of the limitations of the patents at issue are present in Oberthur's smart cards. However, because of the more limited focus of Oberthur's motion, I only address herein those issues dealing with the limitations that Oberthur claims to be missing. I believe that each of the limitations that Oberthur argues is missing from their smart cards is present, either literally or under the doctrine of equivalents.<sup>2</sup>

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<sup>1</sup> The cards other than the American Express cards are collectively referred to as "Xenon" cards. I understand that all of Oberthur's contactless smart cards are made using either the American Express or "Xenon" process.

<sup>2</sup> Until I received Oberthur's papers and the supporting declarations for their motion I did not have Oberthur's stated basis of non-infringement. I understand from counsel that Oberthur did not provide their basis for non-infringement in response to written discovery requests. It would have been difficult to determine an infringement analysis under the doctrine of equivalents without having Oberthur's non-infringement position. I have now done so, and I believe that each of the limitations that Oberthur claims is missing, is in fact present either literally or under the doctrine of equivalents.

8. I am not a lawyer, and I do not profess to have expertise in the legal nuances of patent law. Therefore, I have set forth my understanding of certain assumptions. I understand that an element of a claim can be included either "literally," or "equivalently" under what is called the doctrine of equivalents. I understand that a claim element is "literally" present if the language of the claim reads literally on a step in the process used to make the smart card. I further understand that, even if the smart card does not literally use a step in the patented process, it may have the element "equivalently" if there is no substantial difference between the claim element and the step used. For example, I understand that the accused smart card can have a claim element equivalently if it performs substantially the same function in substantially the same way to achieve substantially the same result as the element in the claim.

#### **Invention Background**

9 Smart cards have been around in various forms since the early 80's. I know this because I have been involved in the smart card industry since 1986 and have had meetings with most of the inventors referred to in the list of key inventions below including Dethloff, Halpern, Arimura, Moreno and Ugon.

#### **Key Inventions:**

1967

J K Ellingboe of TRW Inc invented the smart card as US patent 3637994 first filed as a continuation in part of an application of 29.10.67. This covered not only contact smart cards but also a contactless card with inductive or capacitive coupling to the reader terminal.

1968

J Dethloff and H Grottrup of Deutsche Telecom in 1968 filed a patent USP 3641316 for an identity card that also allowed for both contact and contactless coupling.

1969

J Halpern and W Ward filed a British patent GB1314021 for a digital data carrying card that has inductive coupling to an associable data transfer device.

1970

K Arimura filed a basic smartcard patent in Japan (only) as JP940542, he was also an early proponent of contactless smart cards.

1974

R Moreno was also an early pioneer and filed his first smart card patent in 1974 as USP 3971916 for a portable means of data storage. In his patent Moreno covers a contactless interface using light emitting diodes. This and other smart card patents were asserted by Innovatron a French company set up for this purpose.

1978

Michael Ugon from Honeywell Bull patented his invention USP 4382279 for a single chip microprocessor with on-chip modifiable memory generally referred to as the SPOM (Self Programmable On-chip Memory) patents.

The major commercial product launches of smart cards didn't really start until the 90's when there were two major initiatives, both using contact cards, which account for the majority of smart cards in production today,

1991

The GSM digital mobile telephone system which started operation in mid 1991 incorporates a smart contact card in each mobile handset. These smart cards are usually manufactured in the form of a SIM card where they are punched out of the full size card. By the beginning of 1994 there were 1.3 million subscribers worldwide which had grown to more than 55 million by October 1997. Today there are 2 billion subscribers each with a smart card in the form of a SIM.

1996

The financial payment operators Europay, Mastercard, and Visa published the specification of a smart card for financial use by its member banks. These specifications were known as the EMV 96 specifications and defined a contact smart card consistent with the ISO 7816 standards. In 2006 about 400 million EMV cards were manufactured.

The history of RFID (Radio Frequency Identification) goes back to World War II when the British first developed contactless technology as a means of identifying aircraft returning from mainland Europe. This system was called IFF (Identify: Friend or Foe). In about 1977 contactless technology developed by the U.S. Government was made available to the public sector by Los Alamos National Laboratory. It was shortly after this experimentation began on tracking cattle with implanted RFID tags.

In the mid 80's companies started to reduce the size of the RF technology so that it could be embedded into employee cards for physical access. This eliminated the costs for re-keying locks and issuing new keys. It also helped improve the overall physical security by allowing the use of the cards to be tracked and recorded.

By 1986 Atmel, a semiconductor manufacturer was producing RFID fish tags for tracking salmon. Since then RFID tagging has grown into a major industry for animal tracking, baggage tagging, laundry identification and what has today become called Supply Chain Management for managing goods from manufacture to sale.

The most widely used frequency for physical access control was the LF (Low Frequency) band in the region 100 – 300 KHz. GEC was the first company to introduce contactless smart cards into the UK market in 1985. The CT30 which was the initial offering was nicknamed the 'smart brick' being some 5 mm thick (an ISO ID-1 card is nominally 0.76 mm thick). The ISO standard size card the CT41 came somewhat later. The GEC contactless cards never went into full scale production. AT&T introduced a contactless smart card product with inductive power transfer and capacitive data coupling in the USA in 1986 but it was never put into full scale production.

These early LF contactless smart card developments were the precursor to the ISO 10536 standard for close coupled cards but the standard has never been widely adopted and is largely deprecated today. Those companies still producing LF contactless cards are using proprietary specifications.

In the mid 90's contactless smart cards were very much in their infancy. This is readily apparent from an article by Carol Fancher on smart cards published in Scientific American in August 1996. In the article she says,

“Most smart cards require physical contact between the card and pins in the reader, but a growing set of applications depends on so-called contactless cards.”

“Contactless smart cards are often used in situations where transactions must be processed very fast, as in mass-transit turnstiles. Transit system operators in Hong Kong, Washington, D.C., Manchester, England, and about a dozen other cities have tested contactless cards; Hong Kong will issue three million cards by 1997.”

At this time most of the cards manufactured were largely used for physical access control where it was not necessary for the size and thickness of the card to follow the ISO standards for an ID-1 card (ISO 7810) which defines the ubiquitous bank cards we use today with a nominal thickness of 0.76 mm. Most of these cards were between 2mm and 5mm thick. Upass of Seoul was the first contactless card application introduced for transport payment service in Asia in 1996, using the MIFARE technology in ISO ID-1 format developed by Mikron. Mifare is derived from MIkron FARE-collection system. Mikron was bought by Philips Semiconductors in 1998 and up until very recently Mifare dominated the contactless smart card market with more than 50% market share. Mifare operates at 13.56 MHZ in the High Frequency (HF) band which is the most popular band for contactless smart cards. In the late 90's the ISO 14443 standards were developed to cover these products. Today most new major developments for contactless smart

cards are based on the ISO 14443 standards such as the electronic passport project promoted by the U.S. Government and developed by ICAO (International Civil Aviation Authority) for machine readable transport documents.

The first significant commercial application for contactless smart cards was the Hong Kong Octopus card launched to citizens for public mass transit in September 1997, they actually issued 3 million cards in the first three months of operation using the Sony Felica contactless smart card technology which is based on the ISO ID-1 dimensions. Today over 14 million Octopus smart cards are in circulation.

It is only in the last couple of years that contactless cards have started to increase their significance in the overall smart card market with financial applications such as Paypass (Mastercard 2003), ExpressPay (American Express 2005) and Visa contactless in 2006. For instance in 2004 the contactless microcontroller cards were estimated by the European TB6/SINCE interoperability group to represent about 2% of the total smart card IC market. All these financial applications are based on the ISO 14443 HF standards.

Contactless smart cards have, and continue to evolve over time, as do the components used in the manufacture of smart cards. I agree with the statement made by Herbert Grun, the President of the International Card Manufacturers Association (ICMA), who was deposed by Oberthur in this matter in Munich, Germany. He stated at his deposition with respect to the technology used to manufacture contactless smart cards, that prior to 1994:

**REDACTED**

**REDACTED**

I too agree that in the mid-90's, the difficulty was not with showing that a smart card could work, but instead was in devising a way to manufacture smart cards to both satisfy the customer demands for functionality and appearance, as well as solve the technical manufacturing difficulties of embedding sensitive electronics in plastic in a reliable way. The Leighton patents are unique in part, because they came at a time when the very few manufacturers that were attempting to make contactless smart cards, were experimenting with different methods and processes.

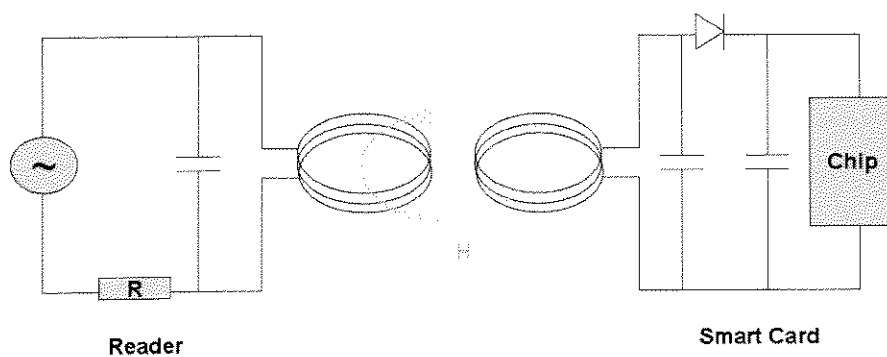
**The technology of contactless smart cards**

RFID tags and tokens can operate in different frequency bands LF (Low Frequency), HF (High Frequency), UHF (Ultra High Frequency), and Microwave. The early contactless smart cards operated in the LF band typically at 125 KHz but the most common band today is the HF band at a frequency of 13.56 MHz which is defined by the ISO 14443 and ISO 15693 standards for proximity (up to 10cm range) and vicinity (up to 1 metre range) cards respectively. These cards

normally operate in passive mode which means that they don't have a battery but have to obtain their power from the smart card reader.

The smart card reader generates in its antenna coil a strong electromagnetic field, at low frequency of say 135 KHz (LF) this has a wavelength of 2400 m and at 13.56 MHz (HF) 22.1 m. Because the distance between the smart card and reader, typically a few centimeters, is very much less than this wavelength this electromagnetic field may be treated as an alternating magnetic field  $H$ .

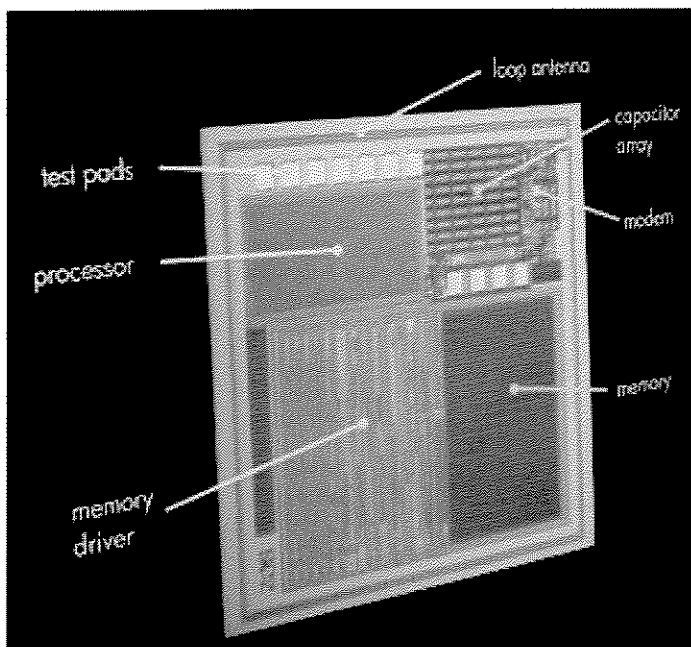
The layout of the two coils for the reader and smart card can be likened to a transformer where the efficiency of the power transferred from the reader resonant circuit (the capacitors shown in the figure are selected accordingly) to the smart card resonant circuit is proportional to the operating frequency, the number of turns on the coil and the effective area enclosed by the smart card coil which is normally laid on the outer periphery of the smart card to optimize this efficiency.



As the frequency increases the necessary requirements for the inductance of the antenna coil decreases so for a LF antenna the coil would typically have a few hundred turns while an HF antenna coil would have about 5 turns.

Data is transferred from the reader to the smart card using the same antenna and modulating the carrier signal usually by ASK (Amplitude Shift Keying) while data is transferred from the smart card back to the reader by what is called load modulation.

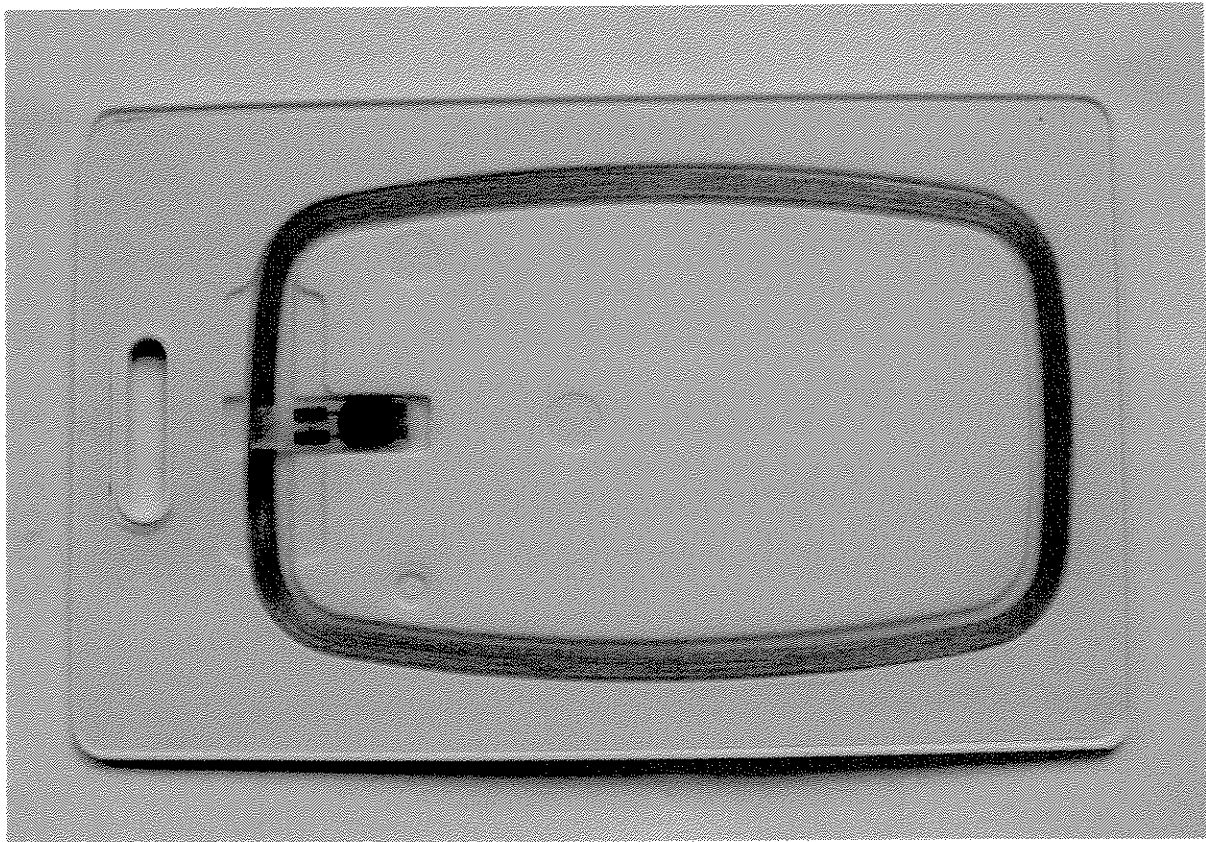
The early smart cards often incorporated multiple electronic elements to create the contactless smart card where the data carrier microcontroller chip was connected to a separate chip that handled the RF signals and power rectification. Today it would be normal to have a single integrated circuit with a separate chip and a separate antenna connected by a bridge to handle the RF functionality as well as the handling of the data. It is even possible to have a single chip with an integrated antenna such as the HP Memory Spot shown in the figure below,



**Figure 1 HP Memory Spot (antenna on chip)**

So a contactless smart card can be made up of multiple electronic elements including multiple integrated circuit elements to create a circuit or a circuit could be made from just a single electronic element. In the majority of cards made today there are multiple electronic elements, including an integrated circuit chip element, an antenna element and a bridge connector element for the etched form of antenna coils.

The figure below shows a photograph of a typical LF access control card with the integrated circuit chip and the antenna coil clearly visible. It can also be seen that all the electronic elements are protected by a milled out recess in the card body. This would be the typical structure of a LF contactless smart card manufactured in 1996.



**Figure 2**

10. I understand that Mr. Leighton was contacted by Motorola in 1995 to assist them with their card manufacturing problems. Mr. Leighton had spent a number of years in the card manufacturing business prior to his work at Motorola in 1995. He had served as a consultant to various companies in connection with their manufacturing processes. I understand that both Mr. Leighton and Motorola were dissatisfied with the results at the conclusion of the consultancy. I further understand that after completing his work at Motorola, Mr. Leighton came up with a new method to produce a contactless smart card that was smooth enough to accept dye sublimation printing, and thin enough to satisfy ISO thickness standards, and meet the demanding requirements of customers such as banks. Mr. Leighton sought the assistance of a patent attorney, who filed a patent application with the United States Patent and Trademark Office for his new method of manufacturing a smart card. The '207 patent issued on October 6, 1998, with 17 claims. The '155 patent issued on April 10, 2001 with 16 claims.

**The Limitation At Issue**

11. I understand from a review of Oberthur's Summary Judgment papers, that it is their position that the smart cards they manufacture do not infringe because they are missing the following limitation, which appears in independent claims 1 and 16 of the '207 and claims 1 and 15 of the '155 patents:

*“positioning said at least one electronic element in absence of a non-electronic carrier directly between said first and second plastic core sheets...”*

Oberthur raises a number of arguments in support of its position that the limitation is missing. I do not agree with Oberthur's arguments for the reasons set forth below, and it is my opinion that this limitation is in fact present in each of Oberthur's cards.<sup>3</sup>

12. The Court and both parties spent a great deal of time and effort discussing various words and phrases within the above limitation at the Markman hearing and in the Court's Markman Order. I do not believe that Oberthur and Dr. Kazmer have considered the limitation appropriately, consistent with the way they have been addressed by the Court, as well as the fact that all of the words and terms in the limitation need to be considered as part of the claim and the overall patent. Oberthur seeks to redefine established terms and improperly consider words in isolation from the remainder of the claim. While Dr. Kazmer appears to be a qualified and knowledgeable engineer, I do not see any materials submitted by him to indicate that he has any prior experience in the contactless smart card manufacturing industry. Therefore, it is not surprising that some of Dr. Kazmer's interpretations of words and terms, are contrary to how I believe one of ordinary skill (with experience in the card manufacturing industry) would understand certain words or terms. Moreover, to the extent that Dr. Kazmer seeks to explain the variations between different types of smart cards, I cannot determine if he is doing so based upon any experience in the card manufacturing industry.

**"positioning said at least one *electronic element*"**

13. In Dr. Kazmer's declaration, he concludes that the Amex and Xenon cards contain a single "*electronic element*", the chip **and** antenna assembly. This conclusion is necessary, according to Dr. Kazmer, because certain dependent claims in the patent refer to a single embodiment in which the "*electronic element*" is a micro-chip and antenna. See e.g. claims 13-

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<sup>3</sup> I understand that for the purposes of this motion, it is only necessary to establish that a triable issue of fact exists as to the absence of the limitation.

15 of the '207 patent and claims 11-13 of the '155 patent. As I understand it, those more narrow claims are not being asserted in this action. Instead, Leighton is asserting the broader independent and dependent claims that are being asserted contain no such limitation.

14. I do not find anything in Oberthur's papers, or Dr. Kazmer's limited discussion of select dependent claims and Leighton patents<sup>4</sup>, that leads me to believe that the Court should abandon its prior claim construction of this particular phrase. Moreover, even apart from the Court's Order, based on my over 30 years of experience, I believe it is incorrect to equate the completion of a circuit between a microchip and an antenna as equivalent to an "*electronic element*." This is particularly true since in the present circumstances I understand that the chips and antennas used in Oberthur's smart cards have separate and independent existences before they are joined together to form a circuit. I have referred previously to a chip with an integrated antenna which might be considered as an "*electronic element*" but I believe that one of ordinary skill with industry experience would understand that in the Oberthur cards, the chip is an "*electronic element*," the antenna is a separate electronic element, and the bridge connecting the antenna and the chip may also be a separate "*electronic element*."

**"in absence of a non-electronic carrier"**

15. A good deal of Dr. Kazmer's declaration proceeds on the assumption that the microchip and antenna in the Oberthur cards are a single "*electronic element*." Based upon this assumption, Dr. Kazmer concludes that the cutout for the chip is therefore a cutout for the one "*electronic element*," and constitutes a recess for that "*electronic element*." For the reasons set

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<sup>4</sup> Dr. Kazmer does not address the many points discussed by the Court in reaching its conclusions regarding this phrase. Also, it appears that while Dr. Kazmer relies upon a patent which deals with hybrid cards to try to support his argument, the '099 patent, he fails to even mention the related patent, which deals with dual interface cards and contains the same "electronic element" phrase. In the '367 patent it is clear that "electronic element" can be only an antenna, since a chip is not added to the dual interface card until after lamination.

forth above, I disagree that the microchip and antenna are a single “*electronic element*,” instead they are two separate electronic elements. Therefore, I also disagree that a cutout for the microchip, is also a cutout or recess for the antenna.

16. I understand the claim language to require that only a single “*electronic element*” satisfy all of the limitations of the claim. That is how I understand the language “*at least one electronic element*”. I do not understand that language to mean “every” or “all” electronic elements in the cards. I do not see any requirement in the claims that requires “every” electronic element in the card to satisfy all of the limitations of the claim. In a similar fashion, if I have chosen to establish that the antenna is the “*at least one electronic element*”, it must satisfy all of the claim limitations. If the “*at least one electronic element*” (the antenna) is missing a limitation, I cannot borrow the presence of the limitation from another electronic elements (i.e. the microchip), to conclude that there is infringement. For the same reason, I believe it is improper for Dr. Kazmer to look to a missing limitation for the chip (which is not the asserted electronic element), and argue that it somehow negates the presence of the limitation for the antenna (the asserted electronic element).

17. Concerning cutouts, the patents are very clear when they require that a card cannot contain any cutouts, anywhere. For example, that restriction, or limitation, is set forth in a dependent claim 16 of patent ‘155’ that states “*said first and second core layers are devoid of any appreciable cutouts*”. Similar language is also set forth in claim 17 of the ‘207 patent. The dependent claims would be meaningless if all of the other claims also required that no cutouts be present for any of the multiple electronic elements.

18. I have reviewed the experiments that Oberthur ran on both the AmEx and Xenon cards. I do not find that the experiments are conclusive of anything, other than the fact that Oberthur is

able by removing the cutout around the chip to cause stress to the chip, and thereby damage either the chip and/or other electronic elements connected in the circuit a certain percentage of the time. This argument seems to be similar to Oberthur's claim that the microchip and the antenna are a single "*electronic element*." It also appears to be similar to the argument that there cannot be any cutouts in any embodiment of the Leighton patents. Moreover, at the Markman hearing, Oberthur's counsel argued in connection with explaining a prior art reference "The point is your Honor, there is no yield limitation in these claims". Transcript for SJ, p.39. A true and correct copy is attached as Exhibit "B". As Dr. Kazmer points out, a certain percentage of the cards continued to work regardless of whether the chip was or was not protected by a cutout. In the Oberthur cards, the "*electronic element*," whether it is an antenna and/or antenna bridge, is not contained in any protective structure, recess or otherwise, so that it cannot be placed directly between the plastic core sheets. Moreover, the presence of a "*non-electronic carrier*" around the microchip in the Oberthur cards does not alter the fact that the antenna and/or antenna bridge are placed "*directly between*" the plastic core sheets, regardless of any pulling, pushing, or tugging on the microchip.

**REDACTED**

**REDACTED**

**REDACTED**

20. **Disclosures of the Prior Art**

In his declaration Dr Kazmer cites 2 patents that he believes provides disclosures of prior art for a protected chip and an unprotected antenna. I have had the opportunity to study both these patents and there is no disclosure of prior art that shows the inventions of the Leighton patents.

**US Patent No 5,880,934 (the '934' patent)**

The '934' patent describes a '**data carrier having separately provided integrated circuit and induction coil**'. The patent describes how a contactless smart card can be produced by bringing together two electronic elements, an integrated circuit module and an antenna coil where the antenna coil is manufactured independently of the integrated circuit module. In his declaration Dr Kazmer compares the manufacture of the Oberthur cards with the method described in the '934' patent. He has said that the antenna coil (number 7 in the figure) is located between two plastic sheets without protection. However this is not the case with the '934' patent and in Fig 4

of this patent showing a cross section of part of the card surrounding the chip module it can be seen that there is an opening (number 3 in the figure) for receiving the chip module (number 6 in the figure). It is equally clear that the antenna coil (number 7 in the figure) on both sides (but only numbered on the left side in the figure) of the chip is protected by this same multi-layer cut-out structure.

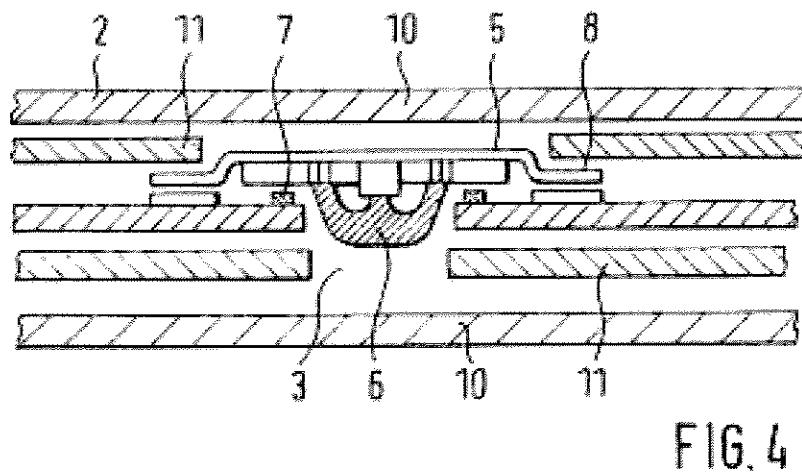


Fig 1 from this same patent shows in plan view how the antenna coils (number 7 in the figure) have to cross the opening in order to create the necessary crossover or bridge that allows the flat coil structure. The antenna terminals are connected to the chip pads (number 8 in the figure).

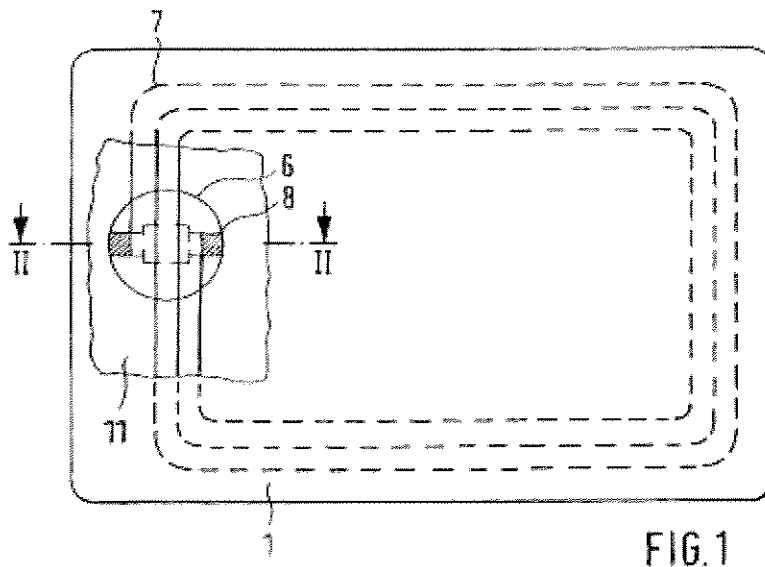


FIG. 1

**International Patent Application Number WO 88/08592 (the '592' patent)**

The '592 patent describes a **'method for the manufacture of and structure of a laminated proximity card'**. The patent describes how the card is manufactured by disposing a printed circuit (the antenna) onto a core layer into which a cavity is created that can encompass the integrated circuit chip. A graphics layer is then disposed on each side of the central core layer followed by a protective layer outside each of the graphics layers.

Figures 1 and 2 from the patent show this configuration in cross section and plan views. The core layer (number 14 in Fig 2, the number is missing from Fig1) holds the printed circuit antenna (number 16 in the figures) and the integrated circuit chip (number 10 in the figures) that is contained in the cavity (number 12 in the figure).

FIG. 1

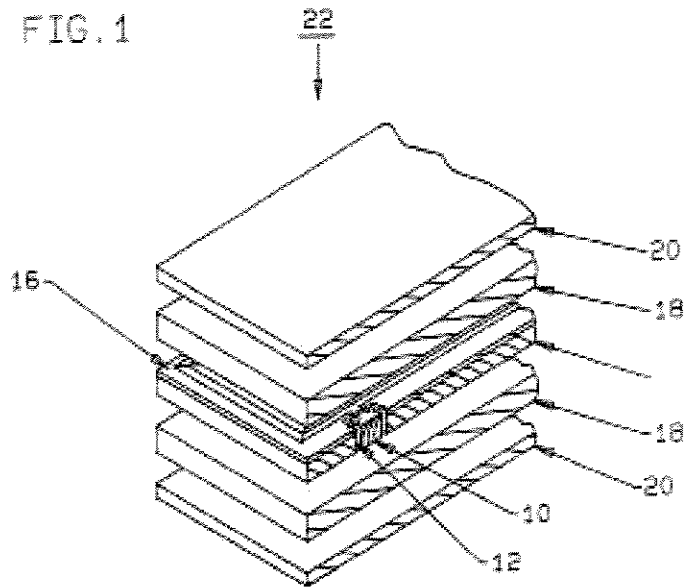
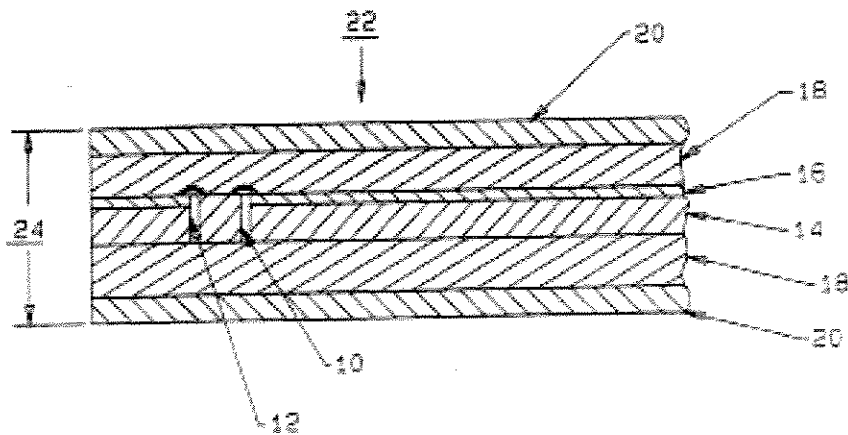


FIG. 2



Dr Kazmer in his declaration has claimed that the antenna is placed directly between two plastic sheets without any protection. But this in fact cannot be construed from the patent. In the figures shown the layers are not drawn to scale because in the description the inventor instructs us that

the core sheet should ideally be thick enough to contain the complete depth of the integrated circuit chip while the graphics layer is thinner with the protective layer thinner still. In this preferred embodiment the antenna is constructed by depositing copper or some other metal onto the core layer which is then etched to leave the antenna structure. Obviously this single layer antenna coil cannot be connected to the chip without creating some form of bridge as shown previously. This is not explained in the patent but as in the '934' patent the antenna bridge would need to be wired up within the protected cavity structure. There is no obvious alternative bridge mechanism.

It is also my view that the '592' patent takes a fundamentally different approach to the card structure from the Leighton patents. The '592' patent looks at constructing the RFID circuit including both the chip and antenna electronic elements within a single thick central core that is then covered with a graphics layer. The Leighton patents describe a construction where the electronic elements are sandwiched between two core layers that are then covered by a protective overlay.

There is nothing in the '592' patent in my view that provides any form of prior art that could affect the validity of the Leighton patents.

**"directly between said first and second plastic core sheets"**

21. Oberthur's argument about the presence of a thousandth of an inch of adhesive is based upon incorrectly construing a single word "*directly*" in isolation from the other words in the same claim "1". The argument ignores the very reason that the language was added to the patents in the first place; and, does not comport with how one of ordinary skill in the art would understand the word, in the context of the invention.

22. An analogy that the Court used in a different context at the Markman hearing illustrates the problems with Oberthur's argument that the Court should consider "*directly*" in isolation from the rest of the claim. In the analogy, assume that plastic sheets and tablecloths are similar. You can buy tablecloths with or without printing, and with or without coatings. Regardless of the way it is finished, it is still a tablecloth. You can also take your tablecloth home, and spill food, ink, or whatever else you want onto it, and it is still a tablecloth. If you now place a hot pot on the tablecloth, it is still directly on the tablecloth regardless of whether it is printed or plain, or clean or dirty. If you want to protect your tablecloth from the hot pot, you might use a trivet, a potholder, or you might even hold your pot above the tablecloth so it does not touch the tablecloth. In these latter cases in which you do something to protect the tablecloth, the hot pot is not placed directly on the tablecloth.

Applying the above analogy to Oberthur's plastic sheets, you can buy plastic sheets with or without printing, and with or without coatings. Regardless of the way it is finished, one of ordinary skill in the art would still consider the above to be a plastic sheet. Alternatively, a card manufacturer can buy a plastic sheet, and print on it or coat it. It is still a plastic sheet. If you place one or more electronic elements between two plastic sheets, they are still "*directly between*" the plastic sheets, regardless of whether the sheets are printed or plain, clean or dirty, coated or not coated. If you want to protect the "*electronic element*," you might use a "*non-electronic carrier*," or you might make sure that there is air space between the plastic sheet and the "*electronic element*" so it does not touch. In these latter cases the "*electronic element*" is not placed "*directly between*" the plastic sheets.

23. I do not agree that the presence of a thin layer of adhesive, the same as the presence of a thin layer of ink, means that the “*electronic element*” is not placed “*directly between*” the plastic sheets. One of ordinary skill, with experience in the card manufacturing industry, would be well aware of the options available for purchasing plastic sheets, and for the purposes of applying ink or adhesive to plastic sheets. Applying a thin layer of adhesive to assist with adherence issues between plastic sheets due the presence of ink for example, has absolutely nothing to do with protecting any electronic element. Ink and adhesive was used for these purposes since at least the time that I started in the industry, in the mid 1980’s, and possibly before that. Instead, adhesive is applied to prevent the card from peeling apart, and thus comply with ISO 7810 a longstanding card requirement that defines the peel strength (delamination) for a laminated card. One of ordinary skill would still consider an “*electronic element*” to be “*directly between*” plastic sheets regardless of the presence of such a thin coating of adhesive or ink. The only exception would be if the adhesive was a type and thickness that was applied for purposes of protection. That simply is not the case here, since Oberthur indicates the antenna does not need any such protection; the adhesive is plastic based just like the plastic sheets; and, is applied thinly just like ink for the sole purpose of improving adherence properties. It is also hard, just like the plastic sheets, and therefore does not cushion any “*electronic element*” from pressure.

**Doctrine of Equivalents**

24. I also understand that Oberthur argues that its cards do not infringe under the Doctrine of Equivalents (“DOE”) because its cards have a substantially different structure from the “*non-electronic carrier*” and direct contact requirements in the claims. It is my opinion that the underlying assumption on which Oberthur relies for its conclusion is fundamentally flawed and therefore its conclusions are misplaced. It is also my opinion that, if Oberthur’s cards are found not to infringe literally, they infringe under the DOE. As I described in detail above, I believe that Oberthur’s cards infringe the claims of the ‘207 and ‘155 patents literally, but if, for arguments sake, it is found that they do not, I have also performed an analysis of Oberthur’s cards under DOE infringement.

25. I have been informed that, under the DOE, an accused product or process that does not literally contain every element of a patent claim may still infringe under the DOE if there are only “insubstantial differences” between the claim language and the accused product or process. I also understand that, for purposes of a DOE infringement analysis, an element in the accused product or process is deemed equivalent to a claim limitation when a person having ordinary skill in the relevant art would determine that the element in the accused product or process “performs substantially the same function in substantially the same way to obtain the same result.”

26. I understand that Oberthur argues that finding infringement under the DOE would violate the doctrine of claim vitiation. I understand that under the doctrine of claim vitiation an element

of an accused product or process is not, as a matter of law, equivalent to a limitation of the claimed invention if such a finding would entirely vitiate the limitation. I understand that in this case, Oberthur argues that a finding of DOE infringement would vitiate two claim limitations: (1) that an “*electronic element*” be positioned “*directly between*” two core sheets, and (2) “*in the absence of a non-electronic carrier*”.

27. I also understand that Oberthur argues that finding DOE infringement would violate the doctrine of prosecution history estoppel. I understand that under prosecution history estoppel, a patent applicant cannot use the DOE to capture subject matter surrendered during prosecution of a patent.

28. Oberthur’s entire argument under the DOE, including its arguments with respect to the doctrines of claim vitiation and prosecution history estoppel, is dependent upon the assumption that the microchip, antenna and bridge between the chip and antenna in Oberthur’s cards are a single “*electronic element*”. Based on this assumption, Oberthur concludes that the cutout or recess for the chip is a “*non-electronic carrier*” for the entire “*electronic element*” (chip, antenna and/or bridge) and that the “*electronic element*” is therefore not “*directly between said first and second plastic core sheets*.” It is my opinion that the microchip, antenna and/or bridge in Oberthur’s cards are separate electronic elements, as discussed in detail above, and therefore the antenna and/or the bridge in Oberthur’s cards is “*at least one electronic element*” that is positioned “*in absence of a non-electronic carrier directly between said first and second plastic core sheets...*” Based on my over 30 years of experience, I believe it is incorrect to equate the completion of a circuit between a microchip and an antenna as equivalent to a single “*electronic*

*element.*” This is particularly true since in the present circumstances I understand that the chips and antennas used in Oberthur’s smart cards have separate and independent existences before they are joined together to form a circuit. I believe that one of ordinary skill with industry experience would understand that in the Oberthur cards, the chip is an “*electronic element*,” that the antenna is a separate “*electronic element*” and the bridge is also a separate “*electronic element*.” Therefore, it is my opinion that there is no difference at all, substantial or insubstantial, between Oberthur’s cards and the asserted claims in this respect.

29. I understand that Oberthur argues that the limitation “*positioning said at least one electronic element in absence of a non-electronic carrier directly between said first and second plastic core sheets...*” in the ‘207 and ‘155 patents does not read on the Xenon cards because the antenna in those cards is partially embedded into the inlay sheet before lamination. Oberthur does not make this argument with respect to infringement under the DOE, however I will nonetheless address this argument here.

Initially, Oberthur’s argument is misguided because the bridge between the microchip and antenna in the Xenon cards (a separate “*electronic element*”) is not embedded in plastic at all prior to lamination. There is no cutout, recess or other carrier present during lamination to protect the bridge and the bridge is placed “*directly between*” the plastic core sheets. Therefore, there is not any difference between the limitation recited above and the Xenon cards. Moreover, it is my opinion that if it is found that this limitation is not met literally, which in my opinion it is, the method of partially embedding, also known as tacking, the antenna in the Xenon cards is equivalent to that limitation. It is my opinion, as a person skilled in the relevant art, that partially embedding or tacking the antenna of the Xenon cards into the surface of the directly adjacent

plastic sheet prior to lamination is only insubstantially different from the structure and method claimed in the limitation recited above. That is, the plastic sheets and antenna in the Xenon cards perform substantially the same function in substantially the same way and achieve the same result as the plastic sheets and “*electronic elements*” disclosed in the limitation recited above. The result is the same for both the Oberthur cards and the patents – a thin, flat card that is aesthetically pleasing and that can be printed on easily and effectively. The functions performed by the plastic sheets and the antenna (“*electronic element*”) in the Oberthur cards is the same as the functions performed by those components found in the limitation of the ‘207 and ‘155 patents cited above in this paragraph. That is, both cards include “*at least one electronic element*” that is positioned between two plastic sheets without the protection of a cutout, recess or other protective carrier. The function performed by the plastic sheet in which the antenna of the Xenon cards is partially embedded does not change simply because the antenna is partially embedded in it. By tacking the antenna onto the plastic sheet, which is much like gluing the antenna onto the sheet, the antenna is not encapsulated by the plastic sheet and the composition or characteristics of the plastic sheet remain the same after the antenna becomes partially embedded. The way in which the “*electronic elements*” in the Xenon cards and the ‘207 and ‘155 patents are laminated between plastic sheets are also substantially the same – in both, the antenna or other “*electronic element*” is positioned directly between two plastic core sheets without any protective carrier, cutout or recess. Although the antenna in the Xenon cards is partially embedded prior to lamination, the antenna is still positioned “*directly between*” plastic core sheets and is not protected by a “*non-electronic carrier*.” Therefore, if there is any difference at all between the ‘207 and ‘155 patents and the Xenon cards as a result of partially embedding the antenna prior to lamination, it is only an insubstantial difference.

30. I understand that Oberthur has also argued that the limitation “*positioning said at least one electronic element in absence of a non-electronic carrier directly between said first and second plastic core sheets...*” in the ‘207 and ‘155 patents does not read on the Amex cards because of the geometry of the antenna in those cards. Specifically, Oberthur argues that because the antenna in the Amex card is a flat, solid strip of aluminum that contains no circuitry, it can withstand greater pressures during lamination without the need for a “*non-electronic carrier.*” Again, Oberthur does not make this argument with respect to infringement under the DOE, but I will nonetheless address this argument here.

Initially, Oberthur again ignores the bridge between the antenna and the microchip. As discussed above in paragraph 29, the bridge is an “*electronic element*” that is placed “*directly between*” plastic sheets without the protection of a cutout, recess or other carrier. Moreover, Oberthur’s argument with respect to the geometry of the antenna in these cards is seriously flawed and it is my opinion that there is no difference at all, substantial or insubstantial, between the structure of the Amex cards, including the flat antenna, and the limitation from the asserted claims of the ‘207 and ‘155 patents that is cited above in this paragraph. I believe that Oberthur, in making this argument, admits that in the Amex cards the antenna is positioned “*directly between*” two plastic sheets in the absence of a “*non-electronic carrier.*” The structure of the antenna is irrelevant to the arrangement of the various components during lamination.

31. Finally, I understand that Oberthur argues that the limitation “*positioning said at least one electronic element in absence of a non-electronic carrier directly between said first and second plastic core sheets...*” does not read on Oberthur’s cards because of a thin layer of

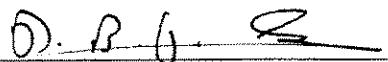
adhesive or epoxy that is present around the antenna of those cards. Again, Oberthur does not make this argument with respect to infringement under the DOE, but I will nonetheless address this argument here.

It is my opinion that the presence of the 0.001 inch thick adhesive layer in the Amex cards and the epoxy layer in the Xenon cards is only insubstantially different from the structure claimed in the limitation cited above in this paragraph. As I discussed in detail above, the adhesive or epoxy is used to assist with adherence issues and provides no protection to any elements during lamination. The adhesive is only applied to prevent the card from peeling apart so as to be compliant with industry standards and therefore the function served by adhesive or epoxy is not in any way related to protection of the “*electronic element*” (antenna) in the cards. The result, with or without the adhesive or epoxy layer, is a thin, flat card that is aesthetically pleasing and that can be printed on easily and effectively. The way that result is attained is also substantially the same -- positioning the antenna and/or bridge directly between two plastic core sheets.

The presence of a thin layer of adhesive or epoxy does not alter the fact that the antenna is still positioned directly between plastic core sheets without any cutouts, recess or other protective carrier to protect the antenna during lamination. Therefore, if there is a difference at all between the ‘207 and ‘155 patents and the Xenon cards as a result of the adhesive or epoxy layers, it is only an insubstantial difference.

32. It is my opinion that, if the Amex and Xenon cards are found not to infringe the '207 and '155 patents literally, Oberthur's cards infringe the patents under the DOE.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct. Executed on this 23<sup>rd</sup> day of January, 2007 at Rustington, England.

  
Dr. David Everett

**CERTIFICATE OF SERVICE**

I hereby certify that a true and correct copy of the foregoing DECLARATION OF DR. DAVID EVERETT SUBMITTED IN OPPOSITION TO DEFENDANTS' MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT, was served on the following on January 26, 2007 by e-mail and overnight mail:

Edward DeFranco  
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/s/ Robert A. Gutkin